

Correlation of the Investigations with Washington State Standards,

Essential Academic Learning Requirements (science TM draft 3b, 2003 09 24)

Essential Academic Learning Requirements—Science

GRADE 10

Investigation 1 – Observing, Predicting and Questioning

Investigation 2 – Solar Panel Orientation

Investigation 3 – Simple Electrolysis

Investigation 4 – Understanding Electrolysis

Investigation 5 – Hydrogen Power

Investigation 6 – Hydrogen Power in Motion

Investigation 7 – Energy Efficiency

Investigation 8 – Extending our Knowledge

Investigation → correlates with standards	1	2	3	4	5	6	7	8
1. SYSTEMS: The student understands and uses scientific concepts and principles to understand systems. To meet this standard, the student will:								
1.1. Properties of Systems: Use properties to identify, describe, and categorize substances, materials, and objects and use characteristics to categorize living things.								
PHYSICAL SCIENCE								
Properties of Substances								
1. Recognize the atomic nature of matter, how it relates to physical and chemical properties, and serves as the basis for the structure and use of the periodic table.			•	•				
Motion of Objects								
2. Describe the average speed, direction of motion, and average acceleration of objects, for example, increasing, decreasing, or constant acceleration.								
Wave Behavior								
3. Describe waves, relating the ideas of frequency, wavelength, and speed, and by relating energy to amplitude.								
Energy Sources and Kinds								

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4. Understand many forms of energy as they are found in common situations on earth and in the universe.		•			•	•		
EARTH/SPACE SCIENCE								
Nature and Properties of Earth Materials								
5. Correlate the chemical composition of earth materials such as rocks, soils, water, gases of the atmosphere, with properties.			•	•				
1.2. Structure of Systems: Recognize the components, structure, and organization of systems and the interconnections within and among them.								
Systems Approach								
1. Analyze systems, including the inputs and outputs of a system and its subsystems.	•	•	•	•	•			
PHYSICAL SCIENCE								
Energy Transfer and Transformation								
2. Understand that total energy is conserved; analyze decreases and increases in energy during transfers and transformations in terms of total energy conservation.					•		•	
Structure of Matter								
3. Relate the structural characteristics of atoms to the principles of atomic bonding.			•	•				
1.3. Changes in Systems: Understand how interactions within and among systems cause changes in matter and energy.								
PHYSICAL SCIENCE								
Nature of Forces								
1. Identify various forces, and their relative magnitudes, and explain everyday situations in terms of force.								
Forces to Explain Motion								
2. Explain the effects of unbalanced forces in changing the direction of motion of objects.								
Physical/Chemical Changes								
3. Analyze and explain the factors that affect physical, chemical, and nuclear changes and how matter and energy are conserved in a closed system.	•	•	•	•	•	•	•	

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2. INQUIRY: The student knows and applies the skills, processes, and nature of scientific inquiry. To meet this standard, the student will:								
2.1. Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.								
Questioning								
1. Study and analyze questions and related concepts that guide scientific investigations.	•	•	•	•	•	•	•	•
Planning and Conducting Investigations								
2. Plan, conduct, and evaluate systematic and complex scientific investigations, using appropriate technology, multiple measures, and safe approaches.	•	•	•	•	•	•	•	•
Explaining								
3. Formulate and revise scientific explanations and models using logic and evidence; recognize and analyze alternative explanations and predictions.	•	•	•	•	•	•	•	•
Modeling								
4. Use mathematics, computers and/or related technology to model the behavior of objects, events, or processes; analyze advantages and limitations of models.					•		•	•
Communicating								
5. Research, interpret, and defend scientific investigations, conclusions, or arguments; use data, logic, and analytical thinking as investigative tools; express ideas through visual, oral, written, and mathematical expression.	•	•	•	•	•	•	•	•
2.2 Nature of Science: Understand the nature of scientific inquiry.								
Intellectual Honesty								
1. Analyze and explain why curiosity, honesty, openness, and skepticism are integral to scientific inquiry.								
Limitations of Science and Technology								
2. Identify and analyze factors that limit the extent of scientific investigation.								•

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Evaluating Inconsistent Results								
3. Compare, contrast, and critique divergent results from scientific investigations based on scientific arguments and explanations.		•						•
Evaluating Methods of Investigation								
4. Analyze and evaluate the quality and standards of investigative processes and procedures.								•
Evolution of Scientific Ideas								
5. Know that science involves testing, revising, and occasionally discarding theories; understand that scientific inquiry and investigation lead to a better understanding of the natural world and not to absolute truth.	•	•	•	•	•	•	•	•
3. DESIGN: The student knows and applies the design process to develop solutions to human problems in societal contexts. To meet this standard, the student will:								
3.1. Designing Solutions: Apply design processes to develop solutions to human problems or meet challenges using the knowledge and skills of science and technology.								
Identifying Problems								
1. Study and analyze challenges or problems from local, regional, national, or global contexts in which science/technology can be or has been used to design a solution.	•	•	•	•	•	•	•	•
Designing and Testing Solutions								
2. Research, model, simulate, and test alternative solutions to a problem.		•	•					•
Evaluating Potential Solutions								
3. Propose, revise, and evaluate the possible constraints, applications, and consequences of solutions to a problem or challenge.			•				•	•
3.2. Science, Technology, & Society: Know that science and technology are human endeavors, interrelated to each other, to society, and to the workplace								
All Peoples Contribute to Science and Technology								

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1. Analyze how scientific knowledge and technological advances discovered and developed by individuals and communities in all cultures of the world contribute to changes in societies.	●							●
Relationship of Science and Technology								
2. Analyze how the scientific enterprise and technological advances influence and are influenced by human activity, for example, societal, environmental, economical, political, or ethical considerations.								●
Careers and Occupations Using Science, Mathematics, and Technology								
3. Investigate the scientific, mathematical, and technological knowledge, training, and experience needed for occupational/career areas of interest.								
Environmental and Resource Issues								
4. Analyze the effects of natural events and human activities on the earth's capacity to sustain biological diversity.								

